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EXAMINER

PATHAK, SUDHANSHU C

ART UNIT

PAPER NUMBER

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/024,048	Applicant(s) FRENKEL, LIRON	
	Examiner Sudhanshu C. Pathak	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on December 14th, 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on December 14th, 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-to-33 are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5-6, 8-9 (method) & 12-14, 16-17, 19-20 (apparatus) are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of ETSI ("Transmission and Multiplexing (TM); Access transmission system on metallic access cables; Symmetrical single pair high bitrate Digital Subscriber Line (SDSL)"; ETSI TS-101 524 v1.1.2; Technical Specification; August 2001, which assumes the same subject matter as in Publication TS 101 524-2; v1.1.1; June 2000).

Regarding to Claims 1-2 & 12-13, the AAPA discloses a method for adaptive-rate communication (Specification, Page 1, Background of Invention, lines 1-4). The AAPA further discloses setting a target signal margin in the startup protocols so as to set the transmission rate (Specification, Page 2, lines 1-9). The AAPA further discloses the transmission rate is chosen so that the measured signal-to-noise ratio (SNR) exceeds a baseline SNR by at least specified margin (Specification, Page 2, lines 7-9). The AAPA further discloses the target margins to be specified relative to either current (actual) line conditions or the expected (predetermined) worst-case

conditions (Specification, Page 3, lines 1-15). The AAPA further discloses the communication channel is one of a plurality of communication channels in a communication system (Specification, Page 1, Background of the Invention, lines 13-18). However, the AAPA does not disclose implementing both the actual noise margin and the predetermined noise margin and selecting the transmission rate if the SNR measured is greater than the baseline SNR by both the noise margins wherein computing the SNR relative to the actual noise level when using the actual noise margin and computing the SNR relative to the predetermined noise level when using the reference (predetermined) noise margin.

ETSI discloses an adaptive-rate communication system (Specification, Page 10, Scope & Specification, Page 13, Reference Configuration, Fig. 4-1). ETSI further discloses implementing two noise margins including current noise margin and/or (both) reference worst-case noise margin (Specification, Page 38, PMMS Target Margin, lines 1-15 & Specification, Page 107, lines 1-6). ETSI further discloses worst-case target margin is selected the target margin is relative to reference worst-case noise specified and if the current-condition target margin is selected the target margin is relative to the measured noise conditions (Specification, Page 106, Code Point Definitions, PMMS Target Margin). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that ETSI teaches implementing both the target margins (current-condition and reference worst-case target margins) and this can be implemented in the communication system as described in the AAPA so as to implement the system in an established standard.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention that when using the current-conditions target margin, compute the SNR relative to the measured actual noise level and when using reference worst-case target margin, compute the SNR relative to the predetermined (reference) noise level.

Regarding to Claim 3 & 14, the AAPA in view of ETSI discloses an adaptive-rate communication system comprising a current-conditions and reference worst-case conditions target margins wherein selecting the transmission rate such that the SNR relative to the actual noise conditions is greater than the baseline SNR by a current condition (actual) noise margin and the SNR relative to reference worst case noise is greater than the baseline SNR by reference worst case noise margin as described above. The AAPA further discloses the communication channel is one of a plurality of channels in a communication system (Specification, Page 1, Background of Invention, lines 13-18), and wherein selecting the transmission rate comprises calculating the worst-case noise level based on the measured actual noise level on the plurality of the channels, and setting the transmission rate so that the level of the signal is greater than the calculated worst-case noise level by at least the reference worst case target signal margin (Specification, Page 1, Background of Invention, lines 2-4 & Specification, Page 2, lines 5-15 & Specification, Page 3, lines 1-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that AAPA in view of ETSI satisfies the limitations of the claim.

Regarding to Claim 5 & 16, the AAPA in view of ETSI discloses an adaptive-rate communication system comprising a current-conditions and reference worst-case conditions target margins wherein selecting the transmission rate such that the SNR relative to the actual noise conditions is greater than the baseline SNR by a current condition (actual) noise margin and the SNR relative to reference worst case noise is greater than the baseline SNR by reference worst case noise margin as described above. The AAPA further discloses selecting the transmission rate comprises selecting a maximum rate among a plurality of available rates on the channel (Specification, Page 1, Background of Invention, lines 1-12 & Specification, Page 2, lines 11-15) {Interpretation: The AAPA discloses chooses the maximum transmission rate that satisfies the minimal SNR criterion i.e. target margins, this implies a plurality of available rates}. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that AAPA in view of ETSI satisfies the limitations of the claims.

Regarding to Claim 6 & 17, the AAPA in view of ETSI discloses an adaptive-rate communication system comprising a current-conditions and reference worst-case conditions target margins wherein selecting the transmission rate such that the SNR relative to the actual noise conditions is greater than the baseline SNR by a current condition (actual) noise margin and the SNR relative to reference worst case noise is greater than the baseline SNR by reference worst case noise margin wherein the transmission rate comprises selecting a maximum rate among a plurality of available rates on the channel as described above. The AAPA further discloses measuring

the level of the signal at each of the plurality of available rates, and choosing the maximum rate based on the measured level of the signal (Specification, Page 1, Background of Invention, lines 1-12) {Interpretation: The AAPA chooses the rate so depending on the SNR criterion or the BER criterion which implies measuring the signal at each rate and then selecting the rate which satisfies the criteria}.

Regarding to Claim 8 & 19, the AAPA in view of ETSI discloses an adaptive-rate communication method (system) comprising a current-conditions and reference worst-case conditions target margins wherein selecting the transmission rate such that the SNR relative to the actual noise conditions is greater than the baseline SNR by a current condition (actual) noise margin and the SNR relative to reference worst case noise is greater than the baseline SNR by reference worst case noise margin as described above. The AAPA further discloses selecting the transmission rate comprises selecting the rate at which to transmit a digital subscriber line (DSL) signal between a central office and customer premises (Specification, Page 2, lines 16-23 & Specification, Page 4, lines 9-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention satisfies the limitation of the claim.

Regarding to Claim 9 & 20, the AAPA in view of ETSI discloses an adaptive-rate communication method (system) comprising a current-conditions and reference worst-case conditions target margins wherein selecting the transmission rate such that the SNR relative to the actual noise conditions is greater than the baseline SNR by a current condition (actual) noise margin and the SNR relative to reference worst

case noise is greater than the baseline SNR by reference worst case noise margin wherein selecting the transmission rate comprises selecting the rate at which to transmit a digital subscriber line (DSL) signal between a central office and customer premises as described above. The AAPA further discloses the DSL signal comprises a single-pair high-speed DSL (SHDSL) signal (Specification, Page 2, lines 16-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention satisfies the limitation of the claim.

4. Claims 4, 7, 10 (method) & 15, 18, 21 (apparatus) are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of ETSI ("Transmission and Multiplexing (TM); Access transmission system on metallic access cables; Symmetrical single pair high bitrate Digital Subscriber Line (SDSL)"; ETSI TS-101 524 v1.1.2; Technical Specification; August 2001) in further view of Polley et al. (6,363,109).

Regarding to Claims 4 & 15, the AAPA in view of ETSI discloses an adaptive-rate communication system comprising a current-conditions and reference worst-case conditions target margins wherein selecting the transmission rate such that the SNR relative to the actual noise conditions is greater than the baseline SNR by a current condition (actual) noise margin and the SNR relative to reference worst case noise is greater than the baseline SNR by reference worst case noise margin wherein the communication channel is one of a plurality of channels in a communication system, and wherein selecting the transmission rate comprises calculating the worst-case noise level based on the measured actual noise level on the plurality of the

channels, and setting the transmission rate so that the level of the signal is greater than the calculated worst-case noise level by at least the reference worst case target signal margin as described above. However, the AAPA in view of ETSI does not disclose measuring the noise in the receiver and conveying an indication of the actual noise level from the receiver to the transmitter for use in calculating the worst case noise level.

Polley discloses a DSL communication system wherein the during initialization and training the SNR is measured in the receiver and then the SNR values are communicated back to the transmitter so that the transmitter can properly allocate bits in a channel to maximize the transmission throughput (Column 7, lines 50-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Polley teaches measuring the noise of the communication channel and conveying an indication of the noise level from the receiver to the transmitter and this can be implemented in the system (method) as described in the AAPA in view of ETSI so as to calculate the worst case noise level and optimally allocate the data for transmission and maximize the transmission throughput.

Regarding to Claims 7 & 18, the AAPA in view of ETSI discloses an adaptive-rate communication system comprising a current-conditions and reference worst-case conditions target margins wherein selecting the transmission rate such that the SNR relative to the actual noise conditions is greater than the baseline SNR by a current condition (actual) noise margin and the SNR relative to reference worst case noise is greater than the baseline SNR by reference worst case noise margin wherein the

transmission rate comprises selecting a maximum rate among a plurality of available rates on the channel and wherein the selecting the maximum rate comprises measuring the level of the signal at each of the plurality of available rates as described above. However, the AAPA in view of ETSI does not disclose measuring the noise in the receiver and conveying an indication of the actual noise level from the receiver to the transmitter for use in calculating the worst case noise level.

Polley discloses a DSL communication system wherein the during initialization and training the SNR is measured in the receiver and then the SNR values are communicated back to the transmitter so that the transmitter can properly allocate bits in a channel to maximize the transmission throughput (Column 7, lines 50-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Polley teaches measuring the noise of the communication channel and conveying an indication of the noise level from the receiver to the transmitter and this can be implemented in the system (method) as described in the AAPA in view of ETSI so as to calculate the worst case noise level and optimally allocate the data for transmission and maximize the transmission throughput.

Regarding to Claims 10 & 21, the AAPA in view of ETSI discloses an adaptive-rate communication system comprising a current-conditions and reference worst-case conditions target margins wherein selecting the transmission rate such that the SNR relative to the actual noise conditions is greater than the baseline SNR by a current condition (actual) noise margin and the SNR relative to reference worst case noise is greater than the baseline SNR by reference worst case noise margin as

described above. However, the AAPA in view of ETSI does not explicitly disclose selecting the transmission rate to comprise setting a variable bit loading for the symbols to be transmitted.

Polley discloses a DSL communication system wherein the during initialization and training the SNR is measured in the receiver and then the SNR values are communicated back to the transmitter so that the transmitter can properly allocate bits in a channel to maximize the transmission throughput (Column 7, lines 50-60) {Interpretation: The bit allocation is interpreted as bit loading and the allocation is based on the measured SNR and therefore is adaptive (variable)}. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Polley teaches setting a variable bit-loading rate for the symbols to be transmitted and this can be implemented in the method (system) as described in AAPA in view of ETSI so as to provide the bit allocation for reliable communication of the symbols, thus satisfying the limitations of the claims.

5. Claims 11 (method) & 22 (apparatus) are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of ETSI ("Transmission and Multiplexing (TM); Access transmission system on metallic access cables; Symmetrical single pair high bitrate Digital Subscriber Line (SDSL)"; ETSI TS-101 524 v1.1.2; Technical Specification; August 2001) in further view of Polley et al. (6,363,109) in further view of McHale et al. (6,385,203).

Regarding to Claim 11 & 22, the AAPA in view of ETSI discloses an adaptive-rate communication system comprising a current-conditions and reference worst-case conditions target margins wherein selecting the transmission rate such that the SNR relative to the actual noise conditions is greater than the baseline SNR by a current condition (actual) noise margin and the SNR relative to reference worst case noise is greater than the baseline SNR by reference worst case noise margin wherein selecting the transmission rate to comprise setting a variable bit loading for the symbols to be transmitted as described above. However, the AAPA in view of ETSI in further view of Polley does not disclose setting a baud rate to be used for upstream and downstream transmissions and wherein setting the variable bit loading rate for both the upstream and downstream.

McHale discloses a method and apparatus for communication over a twisted pair line using xDSL communications techniques (Abstract, lines 1-6). McHale further discloses various upstream/downstream parameters including baud rates and target margins wherein the upstream and downstream baud rates may be different (Fig. 19 & Column 29, lines 1-16). McHale further discloses selecting various baud rates for both upstream and downstream depending on the channel conditions (Fig. 20 & Column 30, lines 33-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that McHale teaches setting a baud rate for both upstream and downstream communications in the training session and this can be implemented in the method and apparatus as described in AAPA in view of ETSI in further view of ETSI so as to set the parameters for the transceivers depending of

the channel conditions for reliable communications, thus satisfying the limitations of the claims.

6. Claims 23-28 (method) & 29-33 (apparatus) are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of McHale et al. (6,385,203).

Regarding to Claims 23-25 & 29-31, the AAPA discloses a method for bi-directional communication, comprising: transmitting single-carrier signals comprising data symbols between first and second Digital Subscriber Line (DSL) modems over a communication channel in upstream and downstream direction: within respective upstream and downstream transmission spectra that are at least partly mutually overlapping (Fig.'s 1-2 & Specification, Page 3, lines 18-30). The AAPA further discloses that the noise level at the customer premise equipment (CPE) is lower than the noise at the central office (CO) (Specification, Page 4, lines 19-22). However, AAPA does not disclose setting different, respective upstream and downstream bit-loading rates for the symbols in the upstream and downstream directions, responsive to conditions on the channel.

McHale disclose setting different, respective upstream and downstream bit-loading rates for the symbols in the upstream and downstream directions, responsive to conditions on the channel, wherein the upstream baud rate is lower than the downstream baud rate and further the baud rates are set during the training session before the data is communicated (Fig.'s 19-21 & Column 29, lines 1-25 & Column 30, lines 21-67 & Column 31, lines 1-35) {Interpretation: McHale discloses

the upstream baud rate to be different from the downstream. McHale further discloses the training process wherein the initial baud rate is set and depending on the channel conditions sets the communications baud rate}. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that McHale discloses setting a baud rate for communications and this can be implemented in the method as described in the AAPA so as to determine the optimal baud rate for communication in the upstream and downstream directions.

Regarding to Claims 26-28 & 32-33, the AAPA in view of McHale discloses a method for transmitting single carrier signals between two DSL modems wherein setting different bit-loading for upstream and downstream wherein further the bit loading upstream is lower than the loading for the downstream and the noise at the customer premise equipment (CPE) is lower than the noise at the central office (CO) as described above. The AAPA further discloses setting the communication rate to be a maximum value rate in the range that meets a signal-to-noise ratio (SNR) margin criterion at a selected baud rate (Specification, Page 1, Background of Invention, lines 1-12 & Specification, Page 2, lines 1-15 & Specification, Page 3, lines 1-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that AAPA in view of McHale satisfies the limitations of the claims. Furthermore, there is no criticality in selecting the baud rate of the upstream and downstream to be substantially the same rate and using the minimum of the upstream or downstream baud rates and using a standard modulation scheme this is a matter of design choice.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, it is recommended to the applicant to amend all the claims so as to be patentable over the cited prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.
- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571)-272-3042
 - The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.
 - Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak


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SUPERVISORY PATENT EXAMINER